

ABSTRACT

A method and device are presented for producing an intensive flow of atoms from an input flow of a molecular gas. Effects of ignition of a gas discharge of a complex type and dissociation of the gas molecules by electron impact in a discharge cell are utilized. The flow of atoms is output from the discharge cell through at least one emitting aperture. The complex gas discharge is composed of a main discharge and two auxiliary discharges of different types ignited in substantially coinciding zones of the discharge cell. The main discharge is an arc Penning discharge ignited in the vicinity of at least one emitting aperture. The first auxiliary discharge is a magnetron discharge with heated cathode, and the second auxiliary discharge is either a Penning discharge, or a Penning discharge with hollow cathode. The dissociation of the gas molecules is thereby carried out in the complex discharge and results in creation of the flow of hot and thermally atoms.